

generally in pairs, or in small troops of four or five. It breeds during the months of November and December; selecting some shallow spout of a tree or log, and laying there four or five oval white eggs, in length 11 to 12 lines, by 7 to 8 lines in breadth. These are very much pointed at both ends, and thickest in the middle. Some were forwarded to me taken at Wellington, in November 1862, from a very shallow spout, at the bottom of which was an old nest of the "Totara" (*Petræca longipes*, G. R. Gray, *loc. cit.* p. 223). It was overhung by the long leaves of the grass-like plant before mentioned.

XVI.—*Ornithology of a Prairie-Journey, and Notes on the Birds of Arizona.* By ELLIOTT COUES, M.D., United States' Army*.

ON the 23rd of April, 1864, I left Washington for the Rocky Mountains, being desirous of taking an ornithological tour through the West, and of spending some considerable time at Fort Whipple in studying our western birds in the field. After a long and exceedingly toilsome journey, devoid (as all journeys beyond the precincts of steam must be) of every "creature comfort," but nevertheless exceedingly interesting and profitable to me in a scientific point of view, I arrived here in health and safety. From Washington I went to Fort Leavenworth by steam, thence to Santa Fé in New Mexico by mail-coach, and thence to this place on horseback, travelling with the military command to which I was attached in my official capacity. This Fort is, in round numbers, about 400 miles south-west of Santa Fé; and throughout the whole of the journey—about 2500 miles—I have kept always on the alert, and, especially in the latter

* Mr. Selater has favoured us with this communication, which we are very glad to receive, since little has hitherto been known of the ornithological features of the country through which the Author passed, or of that in which he is now residing. His observations there will doubtless throw much light on the distribution of the Nearctic Avifauna; especially when taken in connexion with the information that has resulted from the labours of other workers in Mexico and in Central America. In our last Number we mentioned (*suprà*, p. 117) Dr. Coues's departure for the new State of Arizona, almost in the middle of the North American Continent.

stages, had good opportunities for observing and collecting. Now, after a four months' residence, I have become somewhat familiar with the avifauna of this region, and am able to furnish a tolerably full list of its birds, with some brief notes. But first I must sketch, ornithologically, the route hither.

At St. Louis, Missouri, I had the first indication that I was entering upon an avifauna differing from that of the east, by the abundant presence of *Chondestes grammica*. Throughout my whole course this bird was my constant and familiar companion. Near Fort Riley, Kansas, where (delayed by Indian hostilities) I spent ten days collecting, I found further changes, though the type of the fauna was still essentially eastern. The Field-Larks had become *Sturnella neglecta*, the Night-Hawks *Chordeiles henryi*; and I met with *Antrostomus nuttalli*, and numbers of *Vireo belli*. *Actiturus bartramius*, *Actodromas bonapartii*, and *Ereunetes pusillus* were exceedingly numerous, and I shot one *Spizella pallida*. This was in the last week of May.

Directly westward of Fort Riley, the traveller at once comes upon the "Great Prairie"—that vast level flower-bed which stretches without interruption along the Santa Fé road to the Arkansas River, and with but few breaks quite to the Raton Mountains. Here I immediately met with the true prairie-birds. *Calamospiza bicolor* and *Xanthocephalus icterocephalus* were abundant, especially the former, which is the bird, *par excellence*, of those regions. *Eremophila cornuta*, as is well known, breeds in the west much further south than in the east, where, in its spring migration, it does not stop much short of Labrador. *Sturnella neglecta* was still abundant. *Euspiza americana* and *Coturniculus passerinus* held out a few days longer, and then disappeared. The *Calamospiza* stopped abruptly at the first mountains we met; the *Xanthocephalus*, *Eremophila*, and *Sturnella* continued with us through New Mexico into Arizona.

It was here that I first found the "towns" of Prairie-Dogs (*Cynomys ludovicianus*), with, as usual, abundance of *Athene hypogæa*, as well as the inevitable Rattle-snakes.

Wherever there were ponds, marshes, or small lakes on the prairie, I found *Recurvirostra americana*, *Numenius longirostris*, *Steganopus wilsoni*, *Ægialites vociferus*, *Actodromas bonapartii*,

Chræcocephalus franklini, &c. On making the Arkansas River, I first encountered Ravens—probably *Corvus cacolotl*, perhaps *C. carnicorvus*.

The Raton Mountains, to the eastward of Fort Union and Taos, were the first we came to. Here I met with *Herse thalassina*, *Pica hudsonica*, and *Cyanura stelleri*. I found also *Chrysomitris pinus* and *Planesticus migratorius*.

The next point at which I made any observations of moment was Los Pinos, a New Mexican town on the Rio Grande, about twenty miles below Albuquerque. Here I spent a few days busily in collecting. In this, and all other New Mexican towns, the commonest and most characteristic bird is the pretty little "Burion," or *Carpodacus frontalis* (*familiaris*, M'Call). It is there, what *Spizella socialis* is in the east; breeding indifferently in the court-yards, sheds, under porticoes or eaves, and also in the forks of trees in the streets. It has sharp conflicts with the Barn-Swallows, whose nests it often takes possession of. It is a lively and most agreeable feature in the dirty towns which it honours with its presence, and its song is sweet, clear, and exquisitely melodious. *Hirundo horreorum* and *Herse lunifrons* are also very abundant. Among other eastern forms common on the Rio Grande at this point are, *Agelaius phæniceus*, *Zenaidura carolinensis*, *Molothrus pecoris*, *Tinnunculus sparverius*, *Cathartes aura*, *Mimus polyglottus*, *Melanerpes erythrocephalus*, *Pyrrhula æstiva*, *Dendroica æstiva*, and *Cotyle riparia*. As birds not hitherto seen, I found *Himantopus nigricollis*, *Picus scalaris*, *Colaptes mexicanus*, and a *Contopus*, certainly not *C. virens*, though much like that species. It must be *C. richardsoni*, I think. Also *Sayornis sayus* and *Ibis rubra*.

Across the Rio Grande, directly westward of this point, there stretches a barren sandy waste for several days' journey. Here the *Eremophila* again made its appearance, more numerous even than in the Kansas plains, and here I first saw *Ægialites montanus*. A little further on, as we approached Fort Wingate and the Zuni range of the Sierra Madré, the country is more fertile and watered, and I encountered *Poospiza bilineata* and the lovely little *Chrysomitris mexicana* (of which I shall have more to say anon), also the *Myiarchus mexicanus*.

I have been much puzzled by the specimens of *Chordiles* from different regions. The large and light-coloured ones about Missouri and Kansas I had little trouble in referring to *C. henryi*. When in Santa Fé and throughout New Mexico, however, all I saw struck me as being unusually small, and yet, on shooting them, I could not see in what way they differed from *C. virginianus*. They certainly were not *C. henryi*.

Proceeding westward from Fort Wingate, we immediately crossed the "Continental Backbone" at the Zuni Pass, and shortly afterwards entered Arizona. As the avifauna of the rest of the journey hardly differs from that proper to Fort Whipple itself, I will proceed at once to notice the latter.

Fort Whipple is situated about midway between the 34th and 35th parallels of north latitude, and some sixty miles a little to the south of west from the celebrated San Francisco Mountains. To the south and west the vicinity is broken and mountainous, successive tiers of pine-covered elevations rising to from 8,000 to 10,000 feet. Northward and eastward the country is more open and bare for many miles. The average altitude of the place is just about 7500 feet. We are within the great belt of the *Coniferae*, pines being the characteristic *Sylva*. The mountains proper are covered with *Abies douglasi*, *Pinus edulis*, and several other species. On the open and rocky or barren hill-sides we have three species of dwarf oaks—rather bushes than trees—*Algarobia glandulosa*, *Obione canescens*, *Arctostaphylus tomentosa*, *Agave americana*, *Juniperus pachyderma*, and many *Cactaceæ* of the genera *Opuntia*, *Cereus*, *Mammillana*, *Echinocactus*, and *Yucca*. The numerous mountain ravines coalesce into what is locally known as Granite Creek, one of the heads of the San Francisco river, a tributary of the Gila. The bottoms of these ravines are dry, except during heavy storms. Their beds and banks are covered thickly with a growth of *Populus*, *Salix*, *Juglans*, *Cerasus*, *Vitis*, &c. The open plains are either dry and sandy, or covered with 'Gramma' and other grasses.

Among the large game-mammals of the region are to be enumerated *Ursus horribilis*, *U. americanus*, with its variety *cinnamomeus*, *Cervus macrotis* and *C. virginianus*, *Ovis montana*, *Canis*

occidentalis var. *mexicanus*, and *C. latrans*, and doubtless certain of the *Felidæ*, besides *Gulo luscus* and some species of *Mephitis* and *Putorius*, though I have met with none of these latter. Among the smaller mammals we have *Erethizon dorsatum*, *Lepus californicus*, *L. artemisiæ*, *Sciurus aberti*, *Tamias dorsalis*, *Thomomys fulvus*, *Dipodomys ordii*, &c. The last-named species is the most abundant and characteristic of all. Species of *Spermophilus*, *Perognathus*, *Rhithodon*, *Arvicola*, and *Hesperomys* will doubtless be detected.

And now as to the birds, from which I have digressed in order to give a more complete view of the natural-history features of the place where I am at work. It will be seen at a glance from the character of the vicinity, as regards the almost total want of water in the shape of streams or lakes, that the avifauna is cut down at once to the land-birds alone, and also that the mountain-haunting species are chiefly represented. To this I may add that the locality is sufficiently near the Pacific coast for its *Ornis* to incline decidedly towards that of corresponding regions in California. The list which I give is necessarily very incomplete, and it must be remembered that it is the result of less than four months' investigation; but it will, I think, afford a pretty good general idea of the avifauna, and show how rich a region this is both as regards quantity and quality of its species. Many birds as yet rare in collections are the very commonest here. Since the 10th of August, when I began to collect, I have been able to procure about six hundred specimens. I regret having to furnish a list in which certain of the species are only approximately identified; but I am without a single book to aid me, and therefore am obliged to trust entirely to memory. This must be my excuse for the deficiencies which are evident, as well as for any errors that may hereafter be detected.

Cathartes aura is abundant here, as at every point of my route, but towards the latter part of October the species entirely left us. *Hypotriorchis columbarius* is not uncommon; *Tinnunculus sparverius* is very numerous; while *Accipiter mexicanus*, *Circus hudsonius*, and *Buteo montanus* are very common. Several other species of *Buteo* are found here, but I have not been able to procure specimens, though I have in my collection a nearly

black *Buteo* which I cannot identify. *Aquila canadensis* is not uncommon.

Strix americana is rare. Of other Owls I saw one specimen, which I judged to belong to the recently-described *Syrnium occidentale* of Mr. Xantus. I have several examples of *Glaucidium gnoma*, which is apparently not uncommon. This species does not hesitate to come abroad in daytime, and I always find their stomachs full of beetles, grasshoppers, and small lizards.

Picus harrisi vies with *Melanerpes formicivorus* for the supremacy, as the commonest and most characteristic species of Woodpecker. *P. gairdneri* I find, to my surprise, to be very rare here, and I have only met with one or two. I have a specimen of a *Centurus* which I cannot identify, for it seems to be neither *C. flaviventris* nor *C. uropygialis*; it was shot feeding upon the Petahaya-cactus (*Cereus giganteus*). *Melanerpes formicivorus* is probably the very commonest Woodpecker of all. In this region it is exclusively *pinicoline*. I have been much interested in noting the extraordinary variation in the colour of its irides. They are usually described as white, but I have found very few of this colour. Usually they are of a delicate pink or creamy-white—just the hue of the under parts of the *Cræcocephaloid* Gulls in spring. Birds of the year have the iris generally bluish-white or pale greyish-blue, but I have also seen the eyes of a clear yellow or brown. *M. torquatus* is very common, and is in moult until November. Its iris is dark brown. *Sphyrapicus nuchalis*, *S. williamsoni* and *S. thyroideus* are also found here; the first is very common and found everywhere, but seems to prefer live cotton-wood trees and willows; the last two are rarer and almost exclusively *pinicoline*. The genus *Sphyrapicus* is an exceedingly well-marked and natural one. All the species are rather xylophagous than insectivorous. The tongue can be protruded but a very little way beyond the tip of the bill, owing to the extreme abbreviation of the cerato-hyals, the apices of which hardly extend beyond the tympano-maxillary articulation. The horny portion of the tongue, supported on the glosso-hyal, is broad, flat, and obtusely rounded at the extremity, and thickly covered with soft hairs, instead of being, as in other *Picidæ*, acutely pointed and barbed. The species of this group are the

true "Sap-suckers," which have brought all Woodpeckers into ill repute among American farmers. They almost always frequent live trees, and feed upon the soft inner bark itself rather than upon insects. *Colaptes mexicanus* is very common here. The tongue in this genus is capable of protrusion far beyond that of any other North American Woodpeckers.

Selasphorus rufus is very abundant here in summer, and until October. I think I have also *S. platycercus* in my collection.

I have not yet detected *Panyptila melanoleuca* at Fort Whipple, but on the road, just after crossing the Zuni Mountains, I saw great numbers of them about some high cliffs, in company with Bank- and Cliff-Swallows. I shall doubtless find the species here.

Ceryle alcyon I have once seen.

Tyrannus vociferans is very numerous as a summer resident, breeding abundantly. Early in October it left us entirely, as did *Myiarchus mexicanus*, which is also very common. *Sayornis sayus* is rare. *Contopus richardsoni*, or at least the species I noticed in the Rio Grande and took for that, is a summer resident exceedingly abundant. *Empidonax pusillus* is rather rare, while *E. flaviventris* var. *difficilis* is common. Of *Pyrocephalus rubineus* I have one specimen. *Myiadestes townsendi* and *Phænopepla nitens* are rare.

Of *Hylocichla nana* one specimen has been obtained. *Planesticus migratorius* is common in spring and fall. *Sialia mexicana* is very abundant, while *S. arctica* is much less numerous. In autumn *Regulus calendula* is very common.

Anthus ludovicianus is abundant in the fall.

Geothlypis trichas is common, but *G. macgillivrayi* rare. *Icteria longicauda* is a summer resident, and not uncommon. Of the Warblers we have *Dendroica auduboni*, *D. townsendi*, *D. occidentalis*, and *D. nigrescens*. The first I only found after autumn had set in; the last three are among the summer birds, *D. nigrescens* being the rarest. *D. æstiva* is undoubtedly to be found here, and perhaps *D. virens* and *D. superciliosa* also. *Myiodiectes pusillus* is very common.

Cotyle serripennis is not uncommon. *Hirundo lunifrons*, *Herse thalassina*, and *Progne purpurea* are abundant. The last two in this country live among high pines, and nestle in old Woodpeckers' holes.

Of *Collyrio excubitoroides* I have one specimen. *Vireo swainsoni* is not uncommon in summer; concerning its validity as a species distinct from *V. gilvus*, see Professor Baird's remarks in his 'Birds of North America,' under the title of this last-named bird. Another *Vireo*, which is the most abundant in summer, I refer, with some hesitation, to *V. solitarius*. My numerous specimens come nearer to that species than to any other with which I am acquainted. I have not yet found *V. atricapillus*, but I am close to the locality whence it was first procured by Dr. Woodhouse, and I have no doubt of obtaining it in time.

Oreoscoptes montanus is common. Hitherto I have not found *Mimus polyglottus*; and I have been much surprised at not discovering a single *Harporhynchus* of any species. *Salpinctus obsoletus* is rather uncommon.

Thryothorus bewicki is rare; *Cistothorus palustris* and *Troglodytes parkmanni* are common. *Lophophanes wollweberi* and *L. inornatus* are abundant, the former especially so, and resident all the year. A species of *Psaltiriparus*, which I cannot positively identify, but which is probably *P. plumbeus*, is very abundant, and resident all the year. In fall it occurs in large companies of fifty or more. The irides of some individuals are light yellow, of others dark brown. A species of *Polioptila*, either *melanura* or *plumbea*, is not rare.

Eremophila cornuta is common.

Carpodacus californicus and *C. cassini* are not rare, the first indeed is common. *C. frontalis*, I think, is not found here. *Chrysomitris mexicana* is a characteristic bird, being quite as abundant as *C. tristis* is in the east. Numerous specimens of another species, which with much hesitation I am inclined to identify with *C. lawrencii*, were procured late in the fall. If they are really what I take them to be, they are in a plumage hitherto unknown to me. *Passerculus alaudinus* and *Poecetes gramineus* are common, particularly the first. *Chondestes grammica* is very abundant, and in the fall *Zonotrichia gambeli* is exceedingly numerous. Of the last, a few winter here. *Poospiza bilineata* is very common, and *P. belli* not rare. *Spizella pallida* is rather uncommon, but I have besides certainly one [*vide anteà*, p. 118], and I think also a second, new species of this genus. However,

I shall not describe them until, while working up the general results of my investigations, the opportunity of making careful comparisons is afforded me. *Melospiza melodia*—or it may be that my specimens are *M. heermanni*—is common; *Cyanospiza amœna* is rather rare; while *Guiraca melanocephala* is very common in summer. In the fall, *Pipilo chlorurus* is very common; but one of the chestnut and black species of the genus, probably *P. arcticus*, is abundant all the year round.

Molothrus pecoris is doubtless to be found. *Agelæus phæniceus* and *Scolecophagus cyanocephalus* associate together, and are exceedingly numerous, the latter, especially in the fall, about the town and Fort. *Xanthocephalus icterocephalus* is common; but *Sturnella neglecta* just the reverse.

Ravens, probably *Corvus cacolotl*, perhaps *C. carnivorus*, are exceedingly numerous around the Fort. *Cyanocitta woodhousii* is the most abundant and characteristic Jay, but *Cyanura macrolopha* and *Gymnocitta cyanocephala* are also very common. The last I have seen in flocks of several hundreds. These three are the only Garruline birds of the region, so far as I have yet ascertained. *Columba fasciata* is rare; *Melopelia leucoptera* is not uncommon; while *Zenaidura carolinensis* is very abundant.

Lophortyx californicus is the Quail of these regions. Arriving here in July, I have had ample opportunities of studying the species from the egg to the adult bird. *Meleagris mexicana* is rather rare, and occurs only in secluded places among the mountains. I have been surprised at the apparently total absence of Grouse of any species.

Of water-birds, I have seen or procured here so very few species, that it is hardly worth while mentioning them. An occasional *Ægialites*, with *Numenius longirostris*, *Ibis ordii*, and several Ducks complete the assortment.

I should like much to go a little more into detail, as I have enjoyed excellent opportunities of studying the habits of many species regarding which very little is as yet known; but I have already reached the limits of an ordinary contribution. On another occasion I may perhaps have something of greater interest to communicate.

Fort Whipple, Arizona,
November 15, 1864.